

Modular Integrated Construction Laboratory (MiCLab) of HKU



MiCLab INTRODUCTION

香港大學 THE UNIVERSITY OF HONG KONG

LEADING THE FUTURE OF MODULAR INTEGRATED CONSTRUCTION

<https://www.miclab.hk>

VISION
Pursue excellence and innovation in MiC

- Interdisciplinary & Integrated Research**
Civil, Management, CS, ME, EEE, Geo, IMSE
- Gov-Industry-Uni Collaboration**
Basic & Applied research Local & Overseas
- Digitalisation for Sustainability**
AI, IoT, Digital Twin, VR/AR, BIM, GIS, Scanning

A world-leading research laboratory to foster continuous improvements and target excellence in MiC

Director
Prof. Wei PAN

Members
Prof. SC WONG, Prof. Ray SU, Prof. Fu ZHANG, Dr. Cong YU, Dr. Ken ZHANG, Dr. Jet ZHENG (Lab Manager)

Advisors
Prof. CK MAK, Prof. Sam CHAN, Dr. Louis CHU

11 Postdoc Research Fellows
19 Postgraduate Researchers
8 Research Assistants and Engineers

Design (prototyping) | Manufacturing | Transport (with logistics) | Assembly (auto-crane)

Progress M | Quality M | Energy M | DT for life cycle monitoring

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www.miclab.hk

DIGITALISATION RESEARCH & INNOVATION

香港大學 THE UNIVERSITY OF HONG KONG

MiCLab
The University of Hong Kong

- MiConnection – Design Digitalisation**
Generative AI & GA based automatic structural analysis and innovations
- MiChain – SC Digitalisation**
BIM-GIS for supply chain management
- MiCarbon – Performance Digitalisation**
BIM-IoT integrated LCA assessment and monitoring
- MiCrane – Lifting Digitalisation**
Lidar-AI based monitoring
- MiCarry – Transport digitalisation**
AI-IoT-Lidar enabled 3D swept path analysis and traffic impact review
- MiChecking – Manufacturing Digitalisation**
Robotics for MiC QA/QC in Factory

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Introduction of the Organisation

Background

Modular Integrated Construction Laboratory (MiCLab) is a research laboratory established in 2020 at the Department of Civil Engineering of The University of Hong Kong (HKU). MiCLab aims to foster continuous improvements and target excellence in MiC, through the development of innovative strategies and technologies. The objectives include (a) developing a world-leading ‘Laboratory of Excellence’ for research, discourse and dissemination of innovations; (b) implementing interdisciplinary research on MiC; and (c) promoting MiC to achieve digital and sustainable development through government-industry-university collaboration.

Vision

MiCLab strives to achieve excellence and innovation in MiC research with a desire to contribute to the advancement of practice and improvement of the performance of the construction sector in Hong Kong and around the world.

Organisation Chart

MiCLab comprises an Executive Committee with academics from HKU Department of Civil Engineering and other relevant disciplines, and an Advisory Committee with members from academia, government and industry. MiCLab is under direction of Professor Wei PAN, a world-leading scholar in MiC, and has 50+ members including 7 professors and 40+ postgraduate researchers and engineers.

Award and Impacts

MiCLab has made significant achievements and impacts in both academia and industry: (1) HK\$100million+ research grants on MiC and digitalisation; (2) 200+ research papers published on MiC and digitalisation; (3) 10+ industry reports and guidebooks produced; (4) 10+ best paper awards from international conferences and journals; (5) 100+ trained researchers; (6) 5000+ trained professionals via forums and workshops; (7) 30+ keynotes delivered; (8) advised and supported 13+ MiC projects of over billion dollars contract value.

LEADERSHIP, BENEFIT, ACHIEVEMENT, IMPACT

香港大學 THE UNIVERSITY OF HONG KONG

10+ Best/Outstanding Paper Awards

Modular integrated construction, off-site production, advanced prefabrication, productivity and automation

- Smart Traffic Fund (STF), *Smart Planning Platform for Safe and Efficient MiC Module Transport*, HK\$19,200,000, 2023-2025, PI
- Development Bureau, HKSAR Government, *Zero-Accident Module Lifting in MiC through Smart Monitoring and Risk Prevention for Collision Detection and Warning*, 2023-2024
- Housing Authority, HKSAR Government, *Study on Modular Integrated Construction Performance Measurement in Housing Authority*, 2023-2026
- RGC Collaborative Research Fund (CRF), *Optimizing Total Factor Sustainability of Tall Residential Buildings through Innovative Modular Integrated Construction*, HK\$1,750,000, 2021-2024, PI
- Development Bureau, HKSAR Government, *Study on Performance of Modular Integrated Construction in Various Building Projects*, 2021-2026
- RGC (2018), *Enhancing Modular Integrated Construction (MIC) Supply Chain in the Greater Bay Area (GBA) for Hong Kong*, 2019-2025, PI
- RGC (2018), *Modular Integrated Construction 2.0: For Quality and Efficient Tall Residential Buildings through Advanced Structural Engineering, Innovative Building Materials and Smart Project Delivery*, HK\$14.1 million, 2019-2025, PI

HK\$100m+ research grants on MiC & Digitalisation

13+ MiC projects advised & value-added

10+ Industry Guidebooks from MiC theory to implementations

Uni-Gov-Industry Collaboration, e.g. 5+ MoUs

Awards & Honours

~100 researchers & >5000 professionals trained

Knowledge Exchange

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